# 1.0 PURPOSE AND NEED

Chapter 1 presents the United States (U.S.) Department of Energy (DOE), National Nuclear Security Administration's (NNSA) requirements under the *National Environmental Policy Act of 1969* (NEPA), background information on the proposal, the purpose and need for agency action, and a summary of public involvement activities.

## 1.1 Introduction

NEPA requires Federal agency officials to consider the environmental consequences of their proposed actions before decisions are made. In complying with NEPA, the U.S. DOE, NNSA[2], follows the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500–1508) and DOE's NEPA implementing procedures (10 CFR 1021). The purpose of an environmental assessment (EA) is to provide Federal decision makers with sufficient evidence and analysis to determine whether to prepare an environmental impact statement (EIS) or issue a Finding of No Significant Impact (FONSI).

At this time, the NNSA must make a decision regarding installing, operating and maintaining two approximately 20 Megawatt (MW) combustion turbine generators (CTGs) within the Technical Area (TA)-3 Co-generation Complex (Building 3-22) at Los Alamos National Laboratory (LANL). LANL is a Federal facility located at Los Alamos, New Mexico, that comprises 43 square miles (111 square kilometers) of buildings, structures, and forested land (Figure 1). LANL is administered by NNSA for the Federal government and managed and operated under contract by the University of California (UC). This EA has been prepared to assess the potential environmental consequences of the Proposed Action—installing and operating two CTGs—and of the No Action Alternative.

The objectives of this EA are to (1) describe the underlying purpose and need for DOE action; (2) describe the Proposed Action and identify and describe any reasonable alternatives that satisfy the purpose and need for Agency Action; (3) describe baseline environmental conditions at LANL; (4) analyze the potential indirect, direct, and cumulative effects to the existing environment from implementation of the Proposed Action; and (5) compare the effects of the Proposed Action with the effects of the No Action Alternative and other reasonable alternatives. For the purposes of compliance with NEPA, reasonable alternatives are identified as being those that meet NNSA's purpose and need for action by virtue of timeliness, appropriate technology, and applicability to LANL. The EA process provides NNSA with environmental information that can be used in developing mitigation, if necessary, to minimize or avoid adverse effects to the quality of the human environment and natural ecosystems should NNSA decide to proceed with implementing the Proposed Action at LANL.

Ultimately, the goal of NEPA, and this EA, is to aid NNSA officials in making decisions based on an understanding of environmental consequences and taking actions that protect, restore, and enhance the environment.

[2] The NNSA is a separately organized agency within DOE established by Congress in 2000 under Title 50 United States Code (USC) Chapter 41, Subchapter I, Section 2401.

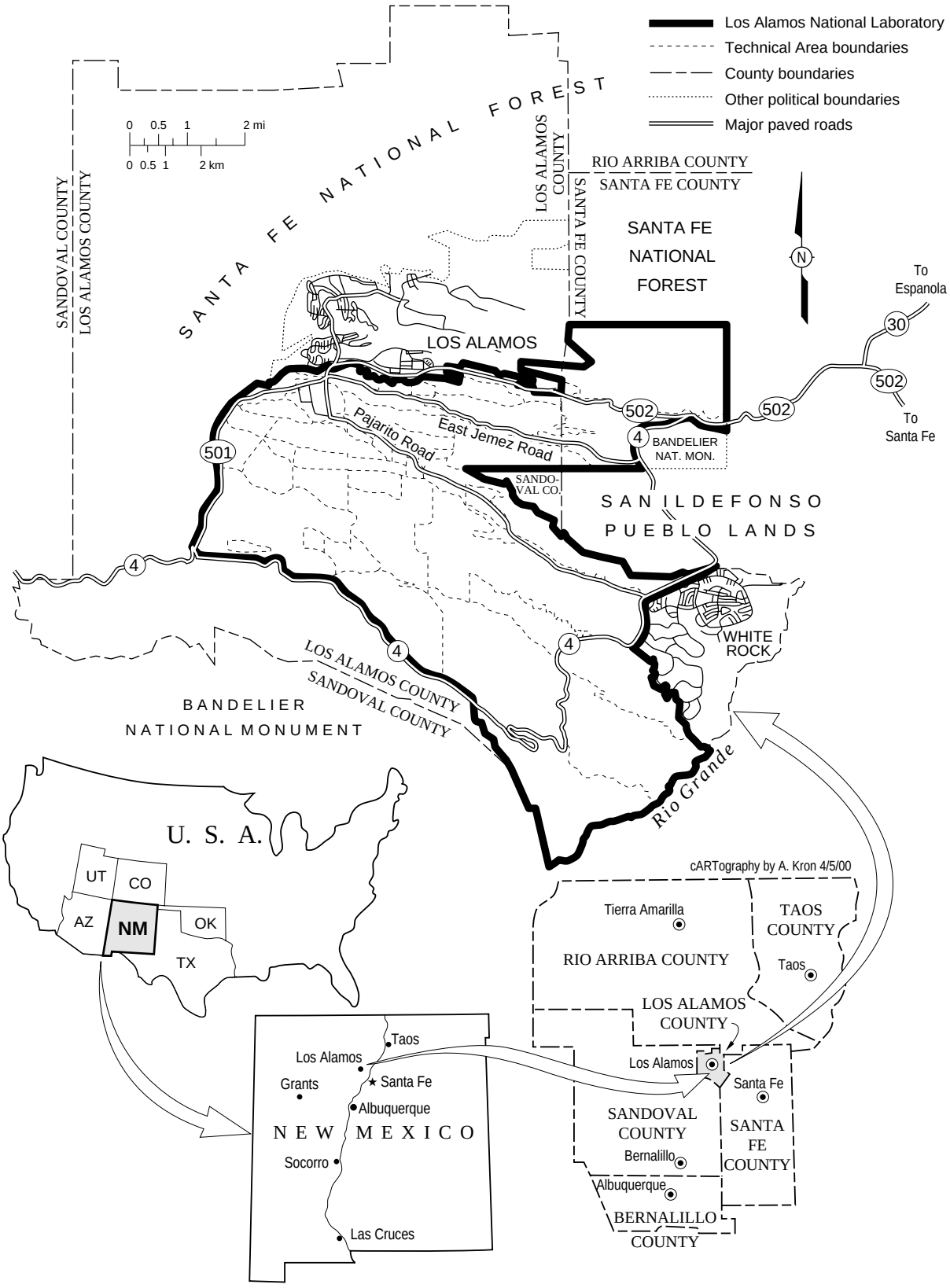


**Figure 1. Location of Los Alamos National Laboratory.**

## 1.2 Background

The U.S. National Security Policy requires the NNSA to maintain core intellectual and technical competencies in nuclear weapons and to maintain a safe and reliable national nuclear weapons stockpile. NNSA fulfills its national security nuclear weapons responsibilities, in part, through activities performed at LANL. LANL is one of three national security laboratories that support DOE and NNSA responsibilities for national security, energy resources, environmental quality, and science. The NNSA's national security mission includes the safety and reliability of the nuclear weapons in the stockpile; maintenance of the nuclear weapons stockpile in accordance with executive directives; stemming the international spread of nuclear weapons materials and technologies; developing technical solutions to reduce the threat of weapons of mass destruction; and production of nuclear propulsion plants for the U.S. Navy. The energy resources mission of DOE includes research and development for energy efficiency, renewable energy, fossil energy, and nuclear energy. The DOE's environmental quality mission for the DOE includes treatment, storage, and disposal of DOE wastes; cleanup of nuclear weapons sites; pollution prevention; storage and disposal of civilian radioactive waste; and development of technologies to reduce risks and reduce cleanup costs for DOE activities. DOE's science mission includes fundamental research in physics, materials science, chemistry, nuclear medicine, basic energy sciences, computational sciences, environmental sciences, and biological sciences, and often contributes to the other three DOE missions. LANL provides support to each of these departmental missions, with a special focus on national security.

To carry out its Congressionally assigned mission requirements, NNSA must maintain a safe and reliable infrastructure at each of the national security laboratories. The 1999 Final *Site-Wide Environmental Impact Statement for Continued Operations of the Los Alamos National Laboratory* (SWEIS) (DOE 1999a) discusses each of the previously identified DOE missions in greater detail and analyzes four different levels of operations at LANL that support these missions. The SWEIS identified the various TAs at LANL and their associated activities and buildings. The SWEIS also identified the existing circumstances of the natural and human-made environment at LANL. Part of the discussion of infrastructure at LANL includes the following statements from the SWEIS (Chapter 3, pages 3-57 and 3-58, Section 3.6.2.9): "Peak electrical demand under the No Action, Expanded Operations, and Greener Alternatives exceeds the power supply in winter and summer; this may result in periodic brownouts. (Power supply to the Los Alamos area has been a concern for a number of years, and DOE continues to work with other users in the area and power suppliers to increase this supply). Natural gas demand is not projected to change across the [SWEIS] alternatives, and this demand is within the existing supply of natural gas to the area; however, the age and condition of the existing supply and distribution system will continue to be a reliability issue for LANL and for residents and other businesses in the area." In the Record of Decision (ROD) for the SWEIS, DOE chose the Expanded Operations Alternative for implementation with some modification regarding certain weapons related operations.

Many buildings and structures and the infrastructure at LANL were built during and immediately after World War II in the mid-1900s. The original installation for the research and development of the world's first nuclear weapon was established at Los Alamos, New Mexico, in 1943 by the Manhattan District of the U.S. Army Corps of Engineers, as a temporary, short-term use facility. The original installation has evolved over the past nearly 60 years into the LANL facility of

today. It is currently under the administration of the NNSA and was designated as a national security laboratory in 1999 when Congressional Act established the NNSA. Upgrades to the various utility services at LANL have been ongoing over the years together with routine maintenance activities. However, the replacement of site utilities is now necessary as these elements have been operating well beyond their original design estimates for the past 20 to 30 years and their components are suffering from normal stresses, strains, and general failures. The TA-3 Co-generation Complex (the Power Plant generates both steam and power) is now 50 years old. The reliability of utility service to LANL and to the residents and commercial businesses of the Los Alamos town site, White Rock community, and residences and businesses beyond Los Alamos County depends upon having intact supply and delivery systems (systems that do not leak product or lose transmission capacity). Reliability of the utility supply and delivery systems also depends upon having redundant system networks. Population growth within Los Alamos County has been far exceeded by population growth of Rio Arriba and Santa Fe Counties over the past 30 years. Expectations are for this upward trend in population growth to continue over the next several decades. Increases in the population of northern New Mexico and increased service demands require the augmentation of certain utility service systems at LANL and within northern New Mexico.

Ownership and distribution of utility services for LANL are currently split between NNSA and Los Alamos County. NNSA owns and distributes most utility services to LANL facilities, and the County provides these services to Los Alamos, White Rock, and in some cases, to nearby Bandelier National Monument located to the south of LANL. Utility services at LANL include electrical power, natural gas, steam, water, wastewater treatment, and waste management and disposal. LANL is supplied with electrical power through the Electric Coordination Agreement, a cooperative arrangement with the County of Los Alamos and the NNSA, known as the Los Alamos Power Pool (Power Pool), which was entered into in 1985. Electric power is supplied to the Power Pool through two existing regional 115-kilovolt (kV) electric power transmission lines, one from the Santa Fe area Norton Substation (the Norton Line) that is owned by NNSA and one from the Albuquerque area Bernalillo-Algodones Substation (the Reeves Line), that is owned and operated by Public Service Company of New Mexico (PNM). Electrical service includes NNSA ownership of a 115-kV power transmission line from the Norton Substation west into LANL and a combination steam heating and electrical power generation plant (a Co-generation Complex) at TA-3 that is operated on an as-needed basis. Secondary power system components include about 34 miles (mi) (45 kilometers [km]) of 13.2-kV distribution lines connecting to the input line side of secondary transformers at LANL facilities. Natural gas service for LANL and the surrounding residential and commercial neighborhoods is purchased from the Meridian Oil Company (Los Alamos County) and the Defense Energy Support Center (LANL) in the San Juan Basin of northwestern New Mexico. PNM owns the main gas transmission supply pipeline feeding into LANL, Los Alamos town site, and beyond into the city of Española. LANL uses most of the natural gas supply provided by PNM to the Los Alamos area. About 90 percent of the natural gas consumed by LANL is used for heating (both steam and hot air) with the remainder being used for steam-generated electrical power.

NNSA has been contemplating upgrading or replacing the aging electric power generators within TA-3 at LANL for the past 10 to 20 years or more as the generators have aged and the repair rate and associated expenses have increased. Additionally, NNSA has also been considering ways to retain the reliability of its electric power service to LANL (for example, NNSA has proposed the

construction and operation of a third, redundant electric power line into LANL [DOE 2000a]), and has also been considering ways to increase the amount of electric power service transmission to LANL for the increased demands projected by the SWEIS. The current electric power and steam generating plant at TA-3 is capable of producing up to 20 MW of electric power that is shared by the Power Pool under contractual arrangement. The Power Pool purchases most of the electric power necessary to meet the use requirements of LANL and Los Alamos County customers from offsite generators. The TA-3 electric power generators are used primarily during peak demand periods of LANL operations and during system outages. Electric power purchases have been at increased cost recently, and future availability of electric power for purchase is uncertain. The TA-3 Co-generation Complex currently provides the additional electric power needed to meet peak load demands when demand exceeds the allowable supply, delivered by two 115-kV transmission lines. When electric power generation is required, steam generation is increased (additional gas is burned), and the extra steam is routed to three steam turbines for power generation. Typically, this occurs only a few months out of the year when the Los Alamos Neutron Science Center (LANSCE) is fully operational. LANSCE is LANL's major accelerator and development complex and home of the linear accelerator that requires large amounts of power. In FY 2000, LANSCE was responsible for approximately 31 percent of the entire electric consumption at LANL (LANL 2001b). Further information about LANSCE is available in the SWEIS (DOE 1999a).

Curtailment due to reductions in network capability of the regional electric transmission system would result in reduction of system capacity and the TA-3 Co-generation Complex would become the major source of electric power to maintain existing LANL electrical demand. Fire damage to transmission systems from the Cerro Grande Fire in 2000 resulted in the shutdown of both 115-kV transmission lines that supply power to LANL and Los Alamos County. The steam turbines at the TA-3 Co-generation Complex were operated and the critical electric power requirement of approximately 15 MW was maintained until the transmission lines could be repaired and power delivery through them resumed.

Historically, offsite power system failures have also disrupted operations in LANL facilities. For example, a near total electrical blackout in New Mexico in 2000 was caused by a grass fire near Farmington, New Mexico. Interruption of the electrical power supply, which has happened several times in the past two to three years, has both direct and indirect consequences to LANL. A one-day shutdown of LANL would have a direct cost (salaries only) of $3M to $5M per day and incalculable indirect costs to research and development, national security programs, and future funding.

Given their current unreliability due to age, it is unlikely that the existing TA-3 electric power generators can consistently meet the demands placed upon them for delivery of the necessary electric power. The existing regional electric power transmission system has been evaluated and found to be deficient in a study conducted by technical representatives of PNM, Plains Electric, and the Power Pool (LM&A 1994). An operating plan intended to minimize the potential for a complete loss of electric service to the Power Pool has been discussed and partially implemented. This plan calls for improved load monitoring, equipment upgrades, and optimization of some available power sources. The local power transmission and distribution lines and the TA-3 Co-generation Complex suffer from several deficiencies. Power line

breakdowns due to deterioration and the inefficiencies of the TA-3 Co-generation Complex compromise the continued reliability of electric power delivery to the Power Pool.

Dependence upon only two power lines to supply LANL and Los Alamos County is inconsistent with prudent utility industry practices for fully redundant power line service to large, critical load areas. Consistent with these practices, other major electricity users in the northern New Mexico area are served by multiple power lines (three or more). Multiple power lines are necessary to provide a contingency supply capability in case of, for example, power line failure due to storms or other natural events or in case of a scheduled outage for maintenance.

The reliability of the Norton Line and the Reeves Line that serve the Power Pool is additionally compromised because they cross at one location within LANL. In doing so, they do not provide physically separate avenues for the delivery of power from independent power supply sources. The crossing of power lines results in a situation where a single outage event, such as a conductor or structural failure, could potentially cause a major power loss to the Power Pool. If such an event occurred when the TA-3 Co-generation Complex was not operating or was being serviced or repaired, there would be no power available to the Power Pool. A single outage event could have serious and disruptive consequences to LANL and to the citizens of Los Alamos County. This vulnerability was noted by the Defense Nuclear Facilities Safety Board.

Heightening concern for reliable delivery of electricity to Power Pool customers is the anticipated growth of load requirements at LANL and within Los Alamos County. If preferred alternatives analyzed in the SWEIS were to be fully implemented, they would result in additional power demands being placed on the Power Pool and, in turn, on the regional electric transmission system. These demands may not be able to be met under the current import agreements for electric power. Power shortages (brownouts) could become more frequent during peak use periods unless greater electric power capability is made available. If one of the two existing transmission lines that bring electric power into the Power Pool fails, dependence on the remaining line would add to reliability concerns. In the event of a single line failure, the remaining line would not be able to transmit the electricity needed to meet the forecasted customer loads, which would result in brownouts or power outages (blackouts).

## 1.3 Statement of Purpose and Need for Agency Action

The DOE, NNSA has assigned a continuing role for LANL in carrying out its national security mission. To enable LANL to continue this enduring responsibility requires that NNSA maintain the capabilities and capacities required in support of its national mission assignments at LANL. In order to accomplish its mission support activities, a reliable, increased electric service supply is necessary. NNSA needs to provide the capability to meet enhanced electric power requirements of LANL facilities in a timely, fiscally prudent manner.

## 1.4 Scope of this EA

A sliding-scale approach (DOE 1993) is the basis for the analysis of potential environmental and socioeconomic effects in this EA. That is, certain aspects of the Proposed Action have a greater potential for creating environmental effects than others; therefore, they are discussed in greater detail in this EA than those aspects of the action that have little potential for effect. For example,

implementation of the Proposed Action would affect air quality in the LANL area. This EA, therefore, presents in-depth descriptive information on air resources to the fullest extent necessary for effects analysis. On the other hand, implementation of the Proposed Action would cause only a minor effect on socioeconomics at LANL. Thus, a minimal description of socioeconomic effects is presented.

When details about a Proposed Action are incomplete, as a few are for the Proposed Action evaluated in this EA (for example, the exact amount of air emissions), a bounding analysis is often used to assess potential effects. When this approach is used, reasonable maximum assumptions are made regarding potential aspects of project activities (Sections 2.0 and 3.0 of the EA). Such an analysis usually provides an overestimation of potential effects. In addition, any proposed future action(s) that exceeds the assumptions (the bounds of this effects analysis) would not be allowed until an additional NEPA review could be performed. A decision to proceed or not with the action(s) would then be made.

## 1.5 Public Involvement

DOE provided written notification of this NEPA review to the State of New Mexico, the four Accord Pueblos (San Ildefonso, Santa Clara, Jemez, and Cochiti), Acoma Pueblo, and the Mescalero Apache Tribe and to over 30 stakeholders in the area on March 22, 2002. In addition, upon release of this draft EA, DOE will allow for a 21-day comment period. Where appropriate and to the extent practicable, concerns and comments will be considered in the final EA.

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